Comparative analysis of antioxidant and antiproliferative activities of _Rhodomyrtus tomentosa_ extracts prepared with various solvents

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_Rhodomyrtus tomentosa_ (Aiton) Hassk. has a wide spectrum of pharmacological effects and has been used to treat wounds, colic diarrhoea, heartburns, abscesses and gynaecopathy. The potential antiproliferative activities of _R. tomentosa_ extracts from different solvents were evaluated in vitro on HepG2, MCF-7 and HT 29 cell lines while antioxidant activity was monitored by radical scavenging assay (DPPH), copper reducing antioxidant capacity (CUPRAC) and β-carotene bleaching assay. Extracts from _R. tomentosa_ show the viability of the cells in concentration-dependent manner. According to the IC50 obtained, the ethyl acetate extracts showed significant antiproliferative activity on HepG2 (IC50 11.47 ± 0.017 mg butylated hydroxytoluene (BHT)/g and 190.467 ± 0.001) due to the presence of high total flavonoid and total phenolic content which were 110.822 ± 0.005 mg gallic acid (GAE)/g and 190.467 ± 0.009 mg gallic acid (GAE)/g respectively. Taken together, the results extracts show the _R. tomentosa_ as a potential source of antioxidant and antiproliferative efficacy.

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1. Introduction

The utilisation of herbal medicines in Asia has a long history related to human interaction with nature. A variety of substances have been found from different traditional medicinal plants which have an ability to treat chronic and infectious diseases (Sasidharan et al., 2011). _Rhodomyrtus tomentosa_ (Aiton) Hassk., a member of the Myrtaceae family, is an abundant evergreen shrub native to Southeast Asia, with rose-pink flowers and dark purple edible bell-shaped fruits (Winotai et al., 2005). This plant prefers natural light and easily adapts to soil conditions. In addition, it needs maintenance and is seldom bothered by pests and diseases. _R. tomentosa_ has a wide spectrum of pharmacological effects and has been used to treat wounds, colic diarrhoea, heartburn, abscesses and gynaecopathy. It has also been used as a painkiller. _R. tomentosa_ has been used in traditional Chinese medicine to treat urinary tract infections. In the early 2000, researchers tried to identify the active molecules and tested different parts of plant extracts, fractions and isolated compounds for antibacterial, antimalarial, antifungal, antioxidant, anti-inflammatory and osteogenic purposes. During the past few years, the ethanol extract of _R. tomentosa_ leaves and rhodomyrtone have been demonstrated to have excellent antibacterial activity against Gram-positive bacteria (Limswan et al., 2012). Phytochemical studies of this plant indicate presence of phenolic compounds of quinic acid, gallic acid and caffeic acid (Maskam et al., 2014). Piccatannol, a promising health-promoting stilbene component, a major phenolic compound exists in the fruits of _R. tomentosa_ (Lai et al., 2015). A range of compounds including acylphloroglucinol, flavonoids, tannins, triterpenes (Tung et al., 2009) and anthocyanins (Cui et al., 2013) have also been identified from this plant. Burton and Ingold (1984) and Rahman (2007) suggested a diet with high consumption of fruits rich in antioxidant property as an effective agent for the prevention of cancer incidence and mortality. Meanwhile, Hockenbery et al. (1993) reported that antioxidants have been used to inhibit apoptosis because apoptosis was initially thought to be caused by oxidative stress. Oxidative stress is important in degenerating cancer (Ames et al., 1993; Dai and Mumper, 2010; Mut-Salud et al.,...